CHAPTER 1

Identifying and Networking with Local Agencies and Citizens

Objectives

Objectives

- Identify watershed concerns

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- Identify other groups/individuals with similar concerns

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- Identify watershed concerns
- Identify other groups/individuals with similar concerns
- Form a steering committee

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- Identify a lead organization

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- Identify a lead organization
- Discuss all existing & perceived concerns

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- Define geographic scope of the watershed

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- Discuss all existing & perceived concerns
- Define geographic scope of the watershed
- Modify committee membership

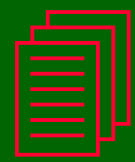
Objectives

- Identify watershed concerns
- Identify other groups/individuals with similar concerns
- Form a steering committee
- Identify a lead organization
- Discuss all existing & perceived concerns
- Define geographic scope of the watershed
- Modify committee membership
- Begin to develop a resource library

Identify watershed concerns

- what is it that's motivating you?

Identify other groups or individuals with similar concerns



TIP

Learn the local political landscape & identify all possible local partners

FOCUS

FOCUS

- on the watershed

FOCUS

- on the watershed
- on the watershed planning process

FOCUS

- on the watershed
- on the watershed planning process
- on the concerns that can be addressed through a watershed plan

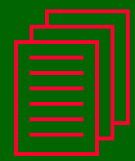
Discuss all existing and perceived concerns

- Opportunity for everyone to state their concerns
- Record concerns

Example Watershed Stakeholders' Concerns

- Newspaper reports of algal blooms in the summer
- Residents' concerns of eroding roadbed at two different road-stream crossings
- Residents' concerns about livestock in the stream at two farms
- General concerns about adequacy of septic systems

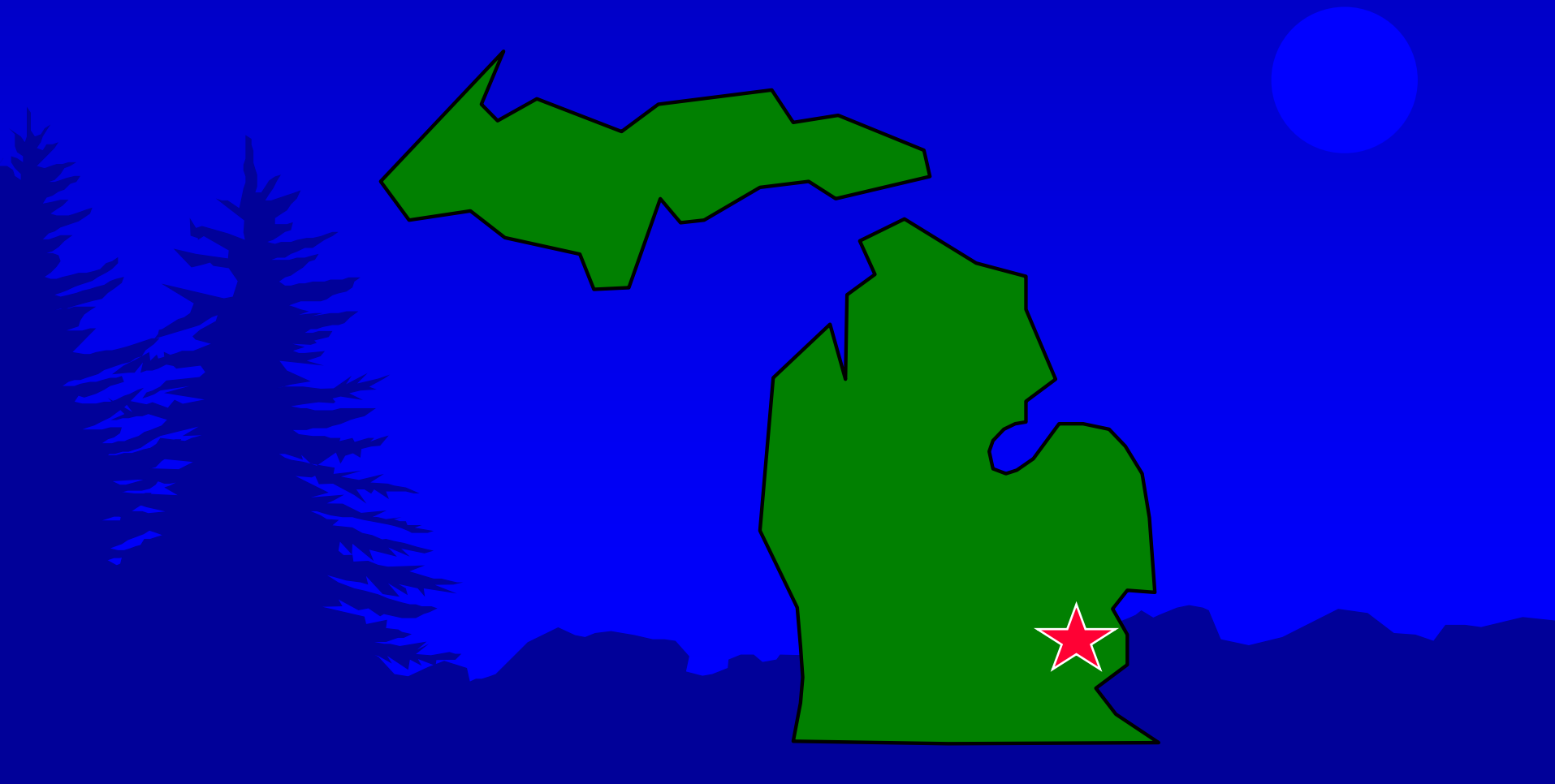
Form a steering committee



TIP

A steering committee provides overall direction. Members include decision makers and groups affected by the change.

Case study:
Bear Creek Watershed Project
Macomb & Oakland Counties



Case study:
Bear Creek Watershed Project
Macomb & Oakland Counties

- As much about fostering collaborative relationships as understanding technical aspects
- One on one meeting to build rapport between members and lead organization
- Opportunity to express reservations about watershed planning process in a private setting

Initial meeting of the Steering Committee

- Review list of concerns
- Add any additional concerns
- Evaluate membership

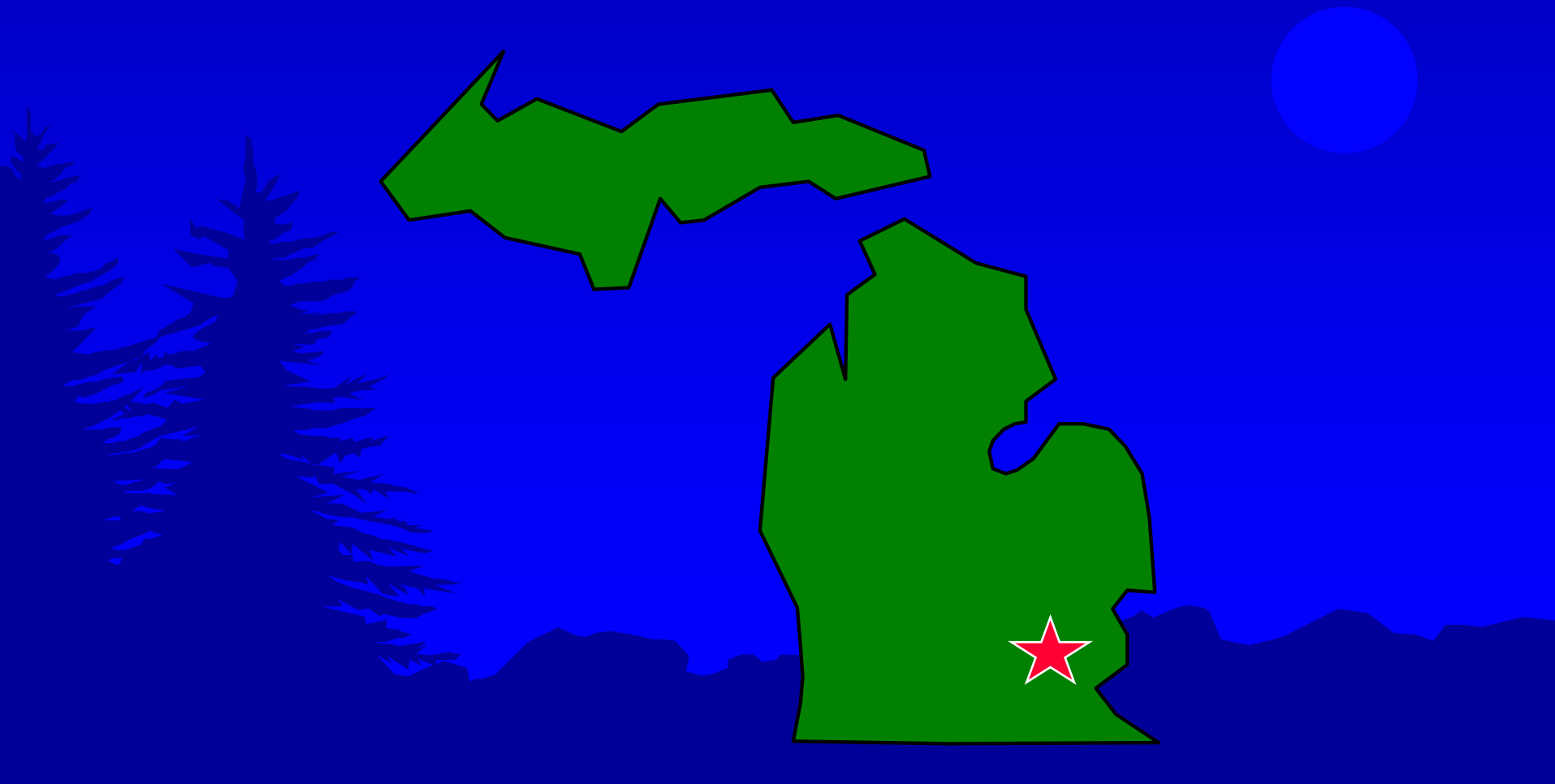
Identify a lead organization

- Ensure planning & implementation moves forward
- Represents entire area
- Has staff & resources
- Based on primary watershed concerns

Steering Committee Roles & Structure

- Secretary - document decisions & distribute them
- Recorder - easel/chalkboard during meeting
- Decisions - majority vote/ consensus/ other process

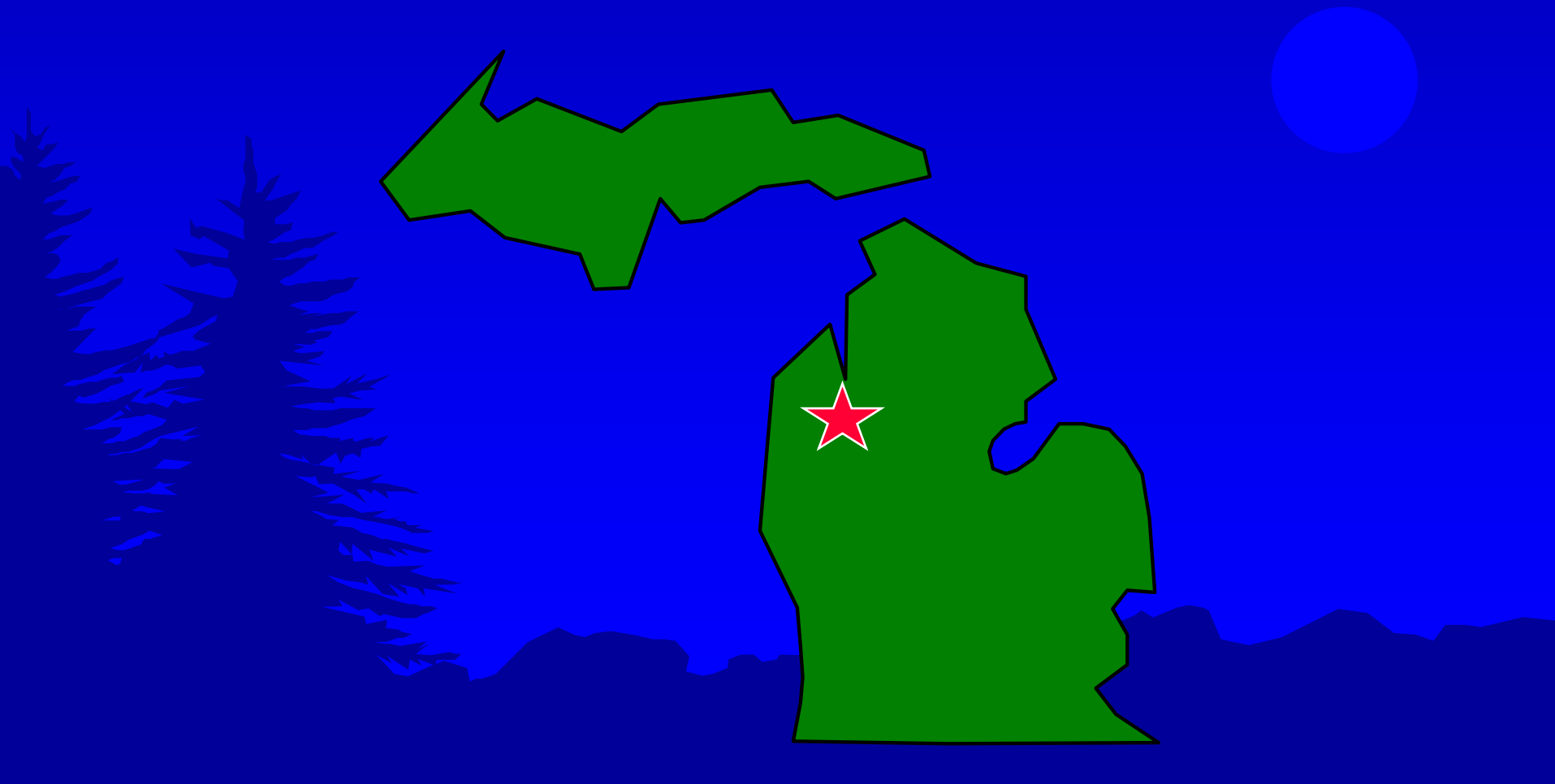
Case study:
Huron River Watershed Council



Structure of the *Huron River Watershed Council*

- 8 - 40 square mile sub-watersheds
- “Creek Group” which develops local networks & implements plan for the sub-watershed
- Steering committee is selected from “Creek Group” membership

Case study:
The Conservation Resource Alliance

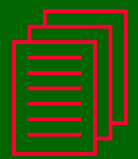


The Conservation Resource Alliance

- Invited all existing local organizations & agencies to participate in the planning process
- formal written partnership agreement stating responsibilities
- each organization represented on steering committee

Form a technical committee

- May be a subgroup of steering committee
- Professional expertise
- Access to resources (maps, data)



TIP

A technical committee provides technical information to the steering committee. Members are experts in one or more fields.

Determine the boundaries and size of your watershed based on:

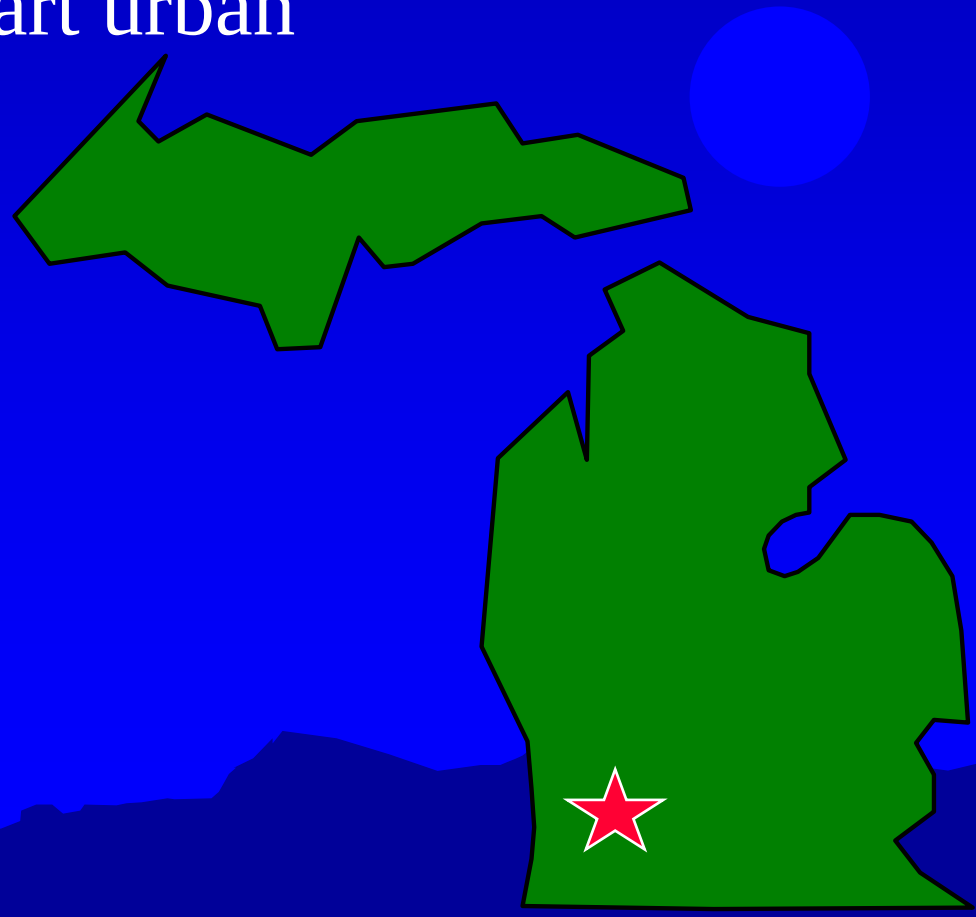
- concerns
- watershed characteristics
- manageable size - 2 square miles to several hundred square miles (less than 150 square miles or 100,000 acres is recommended)

Case study
Gallagher Creek

- rapidly developing
- two pollutants -- sediment and warm surface water runoff
- many sources (development projects)
- 2 square miles

Case study
Davis Creek

- part agricultural, part urban
- many pollutants
- many sources
- 16 square miles



Case study:
Boardman River
Grand Traverse & Kalkaska Counties

- land use undeveloped, forest
- one pollutant - sediment
- two primary sources - stream banks & road crossings
- 295 square miles

Hydrologically distinct

- entire river system


DRAINAGE PATTERN

Hydrologically distinct

- entire river system
- river tributary from headwaters to point where joins main branch


DRAINAGE PATTERN

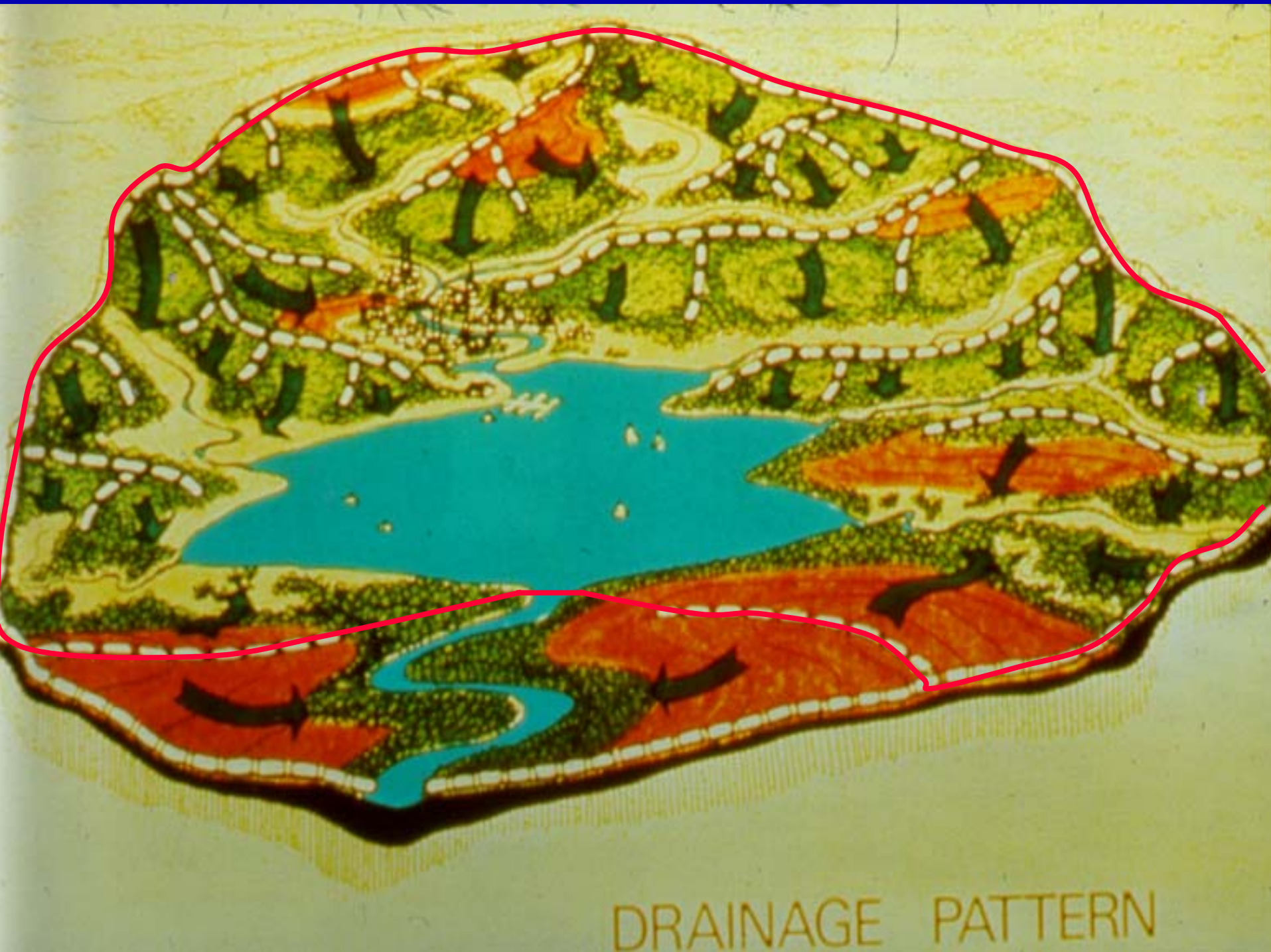
Hydrologically distinct

- entire river system
- river tributary from headwaters to point where joins main branch
- segment of river from headwaters to a dam, or where a tributary joins the river


DRAINAGE PATTERN

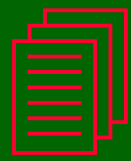
Hydrologically distinct

- entire river system
- river tributary from headwaters to point where joins main branch
- segment of river from headwaters to a dam, or where a tributary joins the river
- lake watershed


DRAINAGE PATTERN

Is your watershed part of a larger project?

- Complement broader scale efforts



TIP

Review the membership of your steering committee. Are all groups represented?

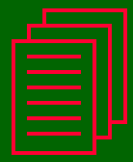
Watershed Map

- Watershed boundaries
- Location of all surface waters (lakes, rivers, streams, wetlands)

Watershed Description

Watershed Description

- hydrology



TOOLS

Topographic Maps

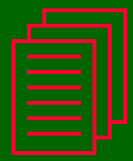
Past studies/reports

CLEAN MICHIGAN INITIATIVE

CMI

Watershed Description

- hydrology
- rainfall characteristics



TOOLS

Soil Surveys

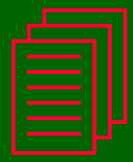
Past studies/reports

CLEAN MICHIGAN INITIATIVE

CMI

Watershed Description

- hydrology
- rainfall characteristics
- topography



TOOLS

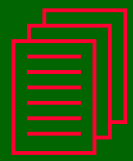
Topographic Maps

CLEAN MICHIGAN INITIATIVE

CMI

Watershed Description

- hydrology
- rainfall characteristics
- topography
- soil types



TOOLS

Soil Surveys

Past studies/reports

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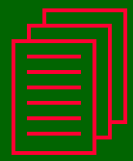
Watershed Description

- hydrology
- rainfall characteristics
- topography
- soil types
- land use



TOOLS

Plat Maps
News articles
Aerial photos

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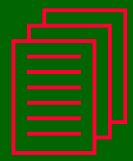
Watershed Description

- hydrology
- rainfall characteristics
- topography
- soil types
- land use
- significant natural resources

Watershed Description

- hydrology
- rainfall characteristics
- topography
- soil types
- land use
- significant natural resources
- community profile



TOOLS

Plat Maps

News articles

Census data

Past studies/reports

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Geographic scope

- Description of the watershed
- Map with watershed boundaries and location of all surface waters

Develop a Resource Library

- All information collected during planning process
- Accessible

Products

- Steering Committee
- Lead Organization
- Technical Committee
- Geographic Scope
  - Watershed Description
  - Map including watershed boundaries
- Resource Library

CHAPTER 2

Getting to Know Your Watershed

Objectives

Objectives

- Identify designated & desired uses

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- Identify pollutants

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- Identify pollutants
- Identify sources of pollutants

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- Identify designated & desired uses
- Identify pollutants
- Identify sources of pollutants
- Identify causes of pollutants

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- Identify designated & desired uses
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- Identify sources of pollutants
- Identify causes of pollutants
- Develop goals based on designated & desired uses

Objectives

- Identify designated & desired uses
- Identify pollutants
- Identify sources of pollutants
- Identify causes of pollutants
- Develop goals based on designated & desired uses
- Develop an initial water quality summary

Identify designated and desired uses for your watershed

Designated Uses

Designated Uses

- Agriculture

Designated Uses

- Agriculture
- Industrial water supply

Designated Uses

- Agriculture
- Industrial water supply
- Public water supply

Designated Uses

- Agriculture
- Industrial water supply
- Public water supply
- Navigation

Designated Uses

- Agriculture
- Industrial water supply
- Public water supply
- Navigation
- Warmwater fishery

Designated Uses

- Agriculture
- Industrial water supply
- Public water supply
- Navigation
- Warmwater fishery
- Other indigenous aquatic life & wildlife

Designated Uses

- Agriculture
- Industrial water supply
- Public water supply
- Navigation
- Warmwater fishery
- Other indigenous aquatic life & wildlife
- Partial body contact recreation

Designated Uses

- Agriculture
- Industrial water supply
- Public water supply
- Navigation
- Warmwater fishery
- Other indigenous aquatic life & wildlife
- Partial body contact recreation
- Total body contact recreation (May 1- Oct 31)

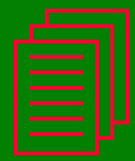
Designated Uses

- Agriculture
- Industrial water supply
- Public water supply
- Navigation
- Warmwater fishery
- Other indigenous aquatic life & wildlife
- Partial body contact recreation
- Total body contact recreation (May 1- Oct 31)

*Some water bodies - coldwater fishery

Is your waterbody meeting designated uses?

- Identify designated use that corresponds to each watershed concern
- Determine if the waterbody is impaired



TIP

Contact DEQ staff, or local agencies. Refer to "Water Quality and Pollution Control in Michigan"

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Example Watershed

Concerns

Algal blooms

Eroding road-stream crossings, river flooding

Livestock in streams, poor fishing

Example Watershed

Concerns	***Designated Uses***
Algal blooms	Partial body contact recreation, warmwater fishery
Eroding road-stream crossings, river flooding	
Livestock in streams, poor fishing	

Example Watershed

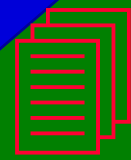
Concerns	***Designated Uses***
Algal blooms	Partial body contact recreation, warmwater fishery
Eroding road-stream crossings, river flooding	Aquatic life/wildlife
Livestock in streams, poor fishing	

Example Watershed

Concerns	***Designated Uses***
Algal blooms	Partial body contact recreation, warmwater fishery
Eroding road-stream crossings, river flooding	Aquatic life/wildlife
Livestock in streams, poor fishing	Warmwater fishery

Desired Uses

- How you want to use your watershed
- Go beyond water quality concerns



TIP

Desired uses are important to the watershed community & should be considered in watershed planning.

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Example Watershed
Desired Uses

Example Watershed Desired Uses

- Developing a recreational trail

Example Watershed Desired Uses

- Developing a recreational trail
- Protecting a corridor

Example Watershed Desired Uses

- Developing a recreational trail
- Protecting a corridor
- Protecting prime agricultural land

Example Watershed Desired Uses

- Developing a recreational trail
- Protecting a corridor
- Protecting prime agricultural land
- Protecting unique habitat

Identify pollutants in your watershed

Designated Use

Agriculture

Public water supply

Navigation

Warmwater fishery

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Identify pollutants in your watershed

Designated Use	***Typical Pollutants***
Agriculture	Hydrology Nitrates
Public water supply	
Navigation	
Warmwater fishery	

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Identify pollutants in your watershed

Designated Use	***Typical Pollutants***
Agriculture	Hydrology Nitrates
Public water supply	Nitrates Pesticides
Navigation	
Warmwater fishery	

CLEAN MICHIGAN INITIATIVE
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Identify pollutants in your watershed

Designated Use	***Typical Pollutants***
Agriculture	Hydrology Nitrates
Public water supply	Nitrates Pesticides
Navigation	Sediment
Warmwater fishery	

CLEAN MICHIGAN INITIATIVE
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Identify pollutants in your watershed

Designated Use	***Typical Pollutants***
Agriculture	Hydrology Nitrates
Public water supply	Nitrates Pesticides
Navigation	Sediment
Warmwater fishery	Sediment Hydrology

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Example Watershed
Known & Suspected Pollutants

Impaired Use

Partial body contact recreation

Aquatic life/wildlife

Warmwater fishery

Example Watershed
Known & Suspected Pollutants

Impaired Use	***Pollutants***
Partial body contact recreation	Nutrients (known) E. coli bacteria (known)
Aquatic life/wildlife	
Warmwater fishery	

Example Watershed
Known & Suspected Pollutants

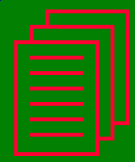
Impaired Use	***Pollutants***
Partial body contact recreation	Nutrients (known) E. coli bacteria (known)
Aquatic life/wildlife	Sediment (known) Nutrients (known) Oils, grease, heavy metals (suspected)
Warmwater fishery	

Example Watershed
Known & Suspected Pollutants

Impaired Use	***Pollutants***
Partial body contact recreation	Nutrients (known) E. coli bacteria (known)
Aquatic life/wildlife	Sediment (known) Nutrients (known) Oils, grease, heavy metals (suspected)
Warmwater fishery	Sediment (known) Nutrients (known) Hydrologic flow (suspected) Oils, grease, heavy metals (suspected) Pesticides (suspected)

Example Watershed
Known & Suspected Pollutants

Threatened Uses	***Pollutants***
Public Water Supply	Nutrients (known)



TIP

Include non-traditional types of pollutants in your list as well (increased temperature, increased flow).

Identify sources of pollutants in your watershed

- origin of pollutants
- include known & suspected
- plan to verify suspected sources during watershed inventory

Example Watershed Sources

Pollutants

Nutrients - phosphorus, nitrogen (known)

Sediment (known)

E. coli bacteria (known)

Hydrologic flow (suspected)

Pesticides (suspected)

Oils, grease and metals (suspected)

Example Watershed Sources

Pollutants	***Sources***
Nutrients - phosphorus, nitrogen (known)	Livestock in stream (known) Failing septic systems (suspect) Residential fertilizer use (suspect)
Sediment (known)	
E. coli bacteria (known)	
Hydrologic flow (suspected)	
Pesticides (suspected)	
Oils, grease and metals (suspected)	

Example Watershed Sources

Pollutants	***Sources***
Nutrients - phosphorus, nitrogen (known)	Livestock in stream (known) Failing septic systems (suspect) Residential fertilizer use (suspect)
Sediment (known)	Livestock in stream (known) Road-stream crossings (known) Stream banks (known)
E. coli bacteria (known)	
Hydrologic flow (suspected)	
Pesticides (suspected)	
Oils, grease and metals (suspected)	

Example Watershed Sources

Pollutants	***Sources***
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Hydrologic flow (suspected)	
Pesticides (suspected)	
Oils, grease and metals (suspected)	

Example Watershed Sources

Pollutants	***Sources***
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E. coli bacteria (known)	Livestock in stream (known) Failing septic systems (suspect)
Hydrologic flow (suspected)	Urban storm water (suspected)
Pesticides (suspected)	
Oils, grease and metals (suspected)	

Example Watershed Sources

Pollutants	***Sources***
Nutrients - phosphorus, nitrogen (known)	Livestock in stream (known) Failing septic systems (suspect) Residential fertilizer use (suspect)
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Hydrologic flow (suspected)	Urban storm water (suspected)
Pesticides (suspected)	Agricultural lands (suspected) Residential gardens (suspected)
Oils, grease and metals (suspected)	

Example Watershed Sources

Pollutants	***Sources***
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E. coli bacteria (known)	Livestock in stream (known) Failing septic systems (suspect)
Hydrologic flow (suspected)	Urban storm water (suspected)
Pesticides (suspected)	Agricultural lands (suspected) Residential gardens (suspected)
Oils, grease and metals (suspected)	Storm drains (suspected) Impervious areas (suspected)

Identify causes of pollutants

- The condition that is creating the source of the pollutant
- Allows you to design successful control measures

Example Watershed Causes

Sources

Livestock in stream (k)
Failing septic systems (s)

Residential fertilizer use (s)
Road-stream crossings (k)
Stream banks (k)

Urban storm water (s)

Agricultural lands (s)
Residential gardens (s)
Storm drains (s)

Impervious surfaces (s)

Example Watershed Causes

Sources	***Causes***
Livestock in stream (k)	Unrestricted access (k)
Failing septic systems (s)	
Residential fertilizer use (s)	
Road-stream crossings (k)	
Stream banks (k)	
Urban storm water (s)	
Agricultural lands (s)	
Residential gardens (s)	
Storm drains (s)	
Impervious surfaces (s)	

Example Watershed Causes

Sources	***Causes***
Livestock in stream (k)	Unrestricted access (k)
Failing septic systems (s)	Improperly designed or maintained septic systems (s)
Residential fertilizer use (s)	
Road-stream crossings (k)	
Stream banks (k)	
Urban storm water (s)	
Agricultural lands (s)	
Residential gardens (s)	
Storm drains (s)	
Impervious surfaces (s)	

Example Watershed Causes

Sources	***Causes***
Livestock in stream (k)	Unrestricted access (k)
Failing septic systems (s)	Improperly designed or maintained septic systems (s)
Residential fertilizer use (s)	Improper application (s)
Road-stream crossings (k)	
Stream banks (k)	
Urban storm water (s)	
Agricultural lands (s)	
Residential gardens (s)	
Storm drains (s)	
Impervious surfaces (s)	

Example Watershed Causes

Sources	***Causes***
Livestock in stream (k)	Unrestricted access (k)
Failing septic systems (s)	Improperly designed or maintained septic systems (s)
Residential fertilizer use (s)	Improper application (s)
Road-stream crossings (k)	Undersized culverts (k)
Stream banks (k)	
Urban storm water (s)	
Agricultural lands (s)	
Residential gardens (s)	
Storm drains (s)	
Impervious surfaces (s)	

Example Watershed Causes

Sources	***Causes***
Livestock in stream (k)	Unrestricted access (k)
Failing septic systems (s)	Improperly designed or maintained septic systems (s)
Residential fertilizer use (s)	Improper application (s)
Road-stream crossings (k)	Undersized culverts (k)
Stream banks (k)	Livestock access (k)
	Human access (s)
Urban storm water (s)	Flow fluctuations (s)
Agricultural lands (s)	
Residential gardens (s)	
Storm drains (s)	
Impervious surfaces (s)	

Example Watershed Causes

Sources	***Causes***
Livestock in stream (k)	Unrestricted access (k)
Failing septic systems (s)	Improperly designed or maintained septic systems (s)
Residential fertilizer use (s)	Improper application (s)
Road-stream crossings (k)	Undersized culverts (k)
Stream banks (k)	Livestock access (k)
	Human access (s)
	Flow fluctuations (s)
Urban storm water (s)	Poor storm water management practices (s)
Agricultural lands (s)	
Residential gardens (s)	
Storm drains (s)	
Impervious surfaces (s)	

Example Watershed Causes

Sources	***Causes***
Livestock in stream (k)	Unrestricted access (k)
Failing septic systems (s)	Improperly designed or maintained septic systems (s)
Residential fertilizer use (s)	Improper application (s)
Road-stream crossings (k)	Undersized culverts (k)
Stream banks (k)	Livestock access (k)
	Human access (s)
	Flow fluctuations (s)
Urban storm water (s)	Poor storm water management practices (s)
Agricultural lands (s)	Improper pesticide application (s)
Residential gardens (s)	
Storm drains (s)	
Impervious surfaces (s)	

Example Watershed Causes

Sources	***Causes***
Livestock in stream (k)	Unrestricted access (k)
Failing septic systems (s)	Improperly designed or maintained septic systems (s)
Residential fertilizer use (s)	Improper application (s)
Road-stream crossings (k)	Undersized culverts (k)
Stream banks (k)	Livestock access (k)
	Human access (s)
	Flow fluctuations (s)
Urban storm water (s)	Poor storm water management practices (s)
Agricultural lands (s)	Improper pesticide application (s)
Residential gardens (s)	Improper pesticide application (s)
Storm drains (s)	
Impervious surfaces (s)	

Example Watershed Causes

Sources	***Causes***
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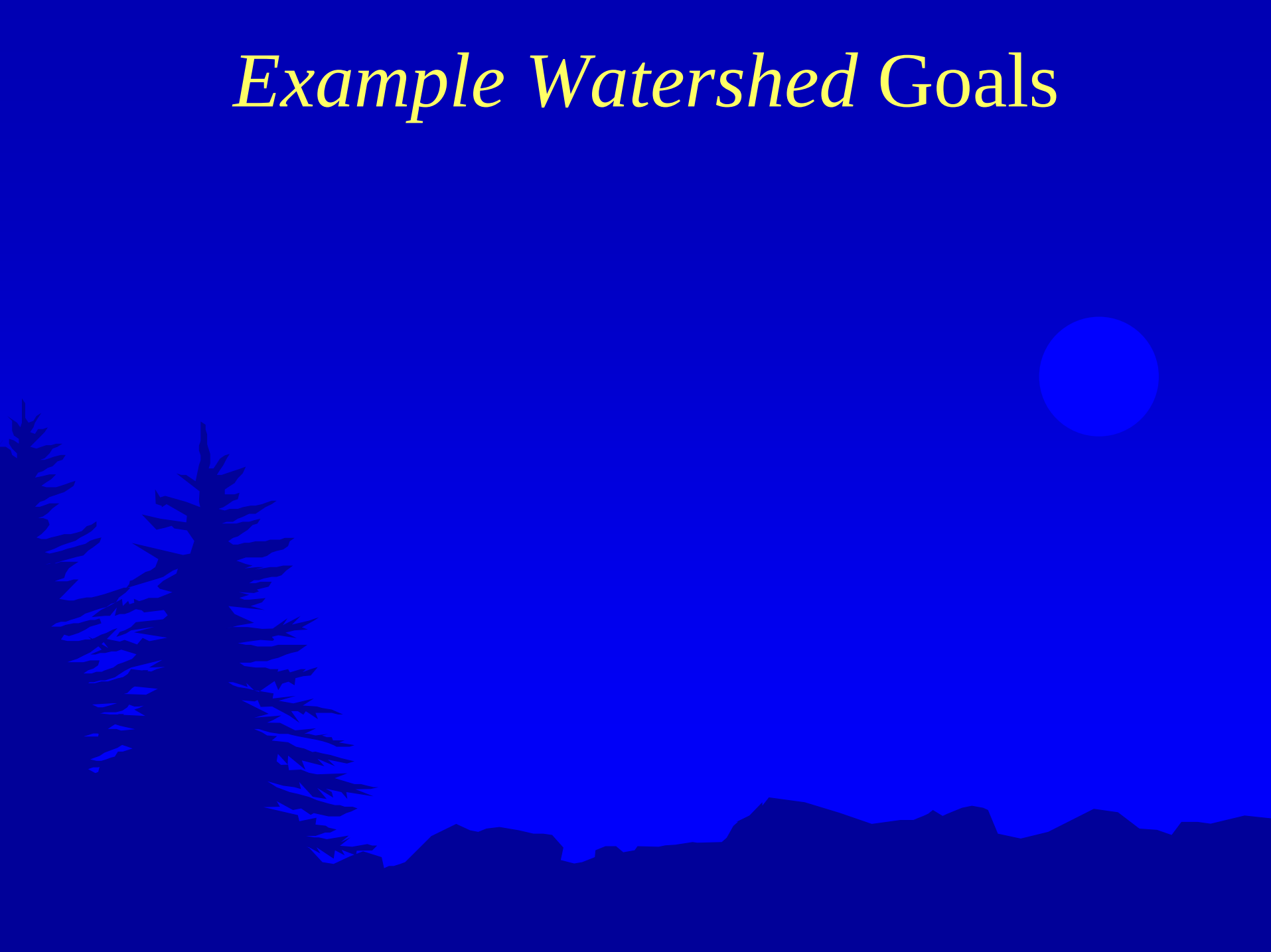
Residential gardens (s)	Improper pesticide application (s)
Storm drains (s)	Improper oil disposal and vehicle maintenance (s)
Impervious surfaces (s)	More roads & parking lots (s)

Develop goals based on designated and desired uses

- Anticipated future state of the watershed
- Broad and changing as you learn more
- Basis for specific objectives and tasks

Example Watershed Goals



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Threatened Uses	***Goal***
Public water supply	Protect the supply by reducing nutrient and pesticide loads

Example Watershed Goals (cont.)

Desired Uses	***Goal***
Recreational trail	Establish a trail along the river

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Protect prime agricultural land	Identify and permanently protect prime agricultural lands
Protect unique habitat	Identify critical habitat for endangered species of concern and ways to protect the habitat

Product

- Initial water quality summary

Initial water quality summary

Short, clearly written description of water quality in the watershed that includes:

- designated uses addressed in the plan

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Example Watershed Water Quality Summary

The Example Watershed waterbody has three designated uses that are impaired: (1) partial body contact recreation, (2) aquatic life/wildlife, and (3) warmwater fishery. The designated use public water supply is threatened.

The first project goal is to restore partial body contact recreation use by reducing *E. coli* bacteria and nutrient loadings. The second goal is to ...

Recreation:

The designated use of partial body contact recreation is impaired due to undesirable algal blooms and *E. coli* levels. The only known source of these pollutants is livestock in the stream. Suspected sources include failing septic systems and the misapplication and/or overapplication of fertilizer in residential areas.

.

Uncontrolled livestock access to streams results in E. coli and nutrient deposition directly into the water. When septic systems do not properly treat wase, nitrates can be transported from the septic field area to the waterbody where they can contribute to increased plant growth and dissolved oxygen depletion. The misapplication and/or over application of fertilizers can result in nutrients being transported from the land to the waterbody where algal blooms are formed

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